

## Digital Correction Signal Processor

### OVERVIEW

The PALADIN family of digital multi-carrier chip technologies enables the development of spectrally efficient and power efficient 2G and 3G base stations that use fewer and less expensive components than traditional feed-forward designs.

PALADIN products include PALADIN 10, PALADIN 15, and PALADIN Waveshaper. All PALADIN products make extensive use of proprietary advanced high-speed DSP based architectures and techniques.

### FEATURES

PALADIN 10 inhibits distortion in the power amplifier and transmitter chain of cellular base stations using digital adaptive predistortion techniques. The PALADIN 10 solution transforms inexpensive Class AB power amplifiers into wideband, multi-carrier, high-

efficiency, digitally controlled amplifier units that can replace expensive, low-efficiency, feedforward-based multi-carrier power amplifiers (MCPA) commonly used in many BTS designs.

The PALADIN 10 system comprises the Digital Correction Signal Processor (DCSP) PM7800 chip and the Adaptive Control Processor Compensation Engine (ACPCE). The DCSP applies corrective parameters to each sample in real time, while the ACPCE automatically adapts the corrective parameters to maintain optimum performance as the distortions change over time.

Key features of PALADIN 10 include:

- Input signal bandwidth up to 10MHz.
- Output sample rate up to 80MHz.
- Variable input sample rate.
- 32-bit complex baseband reference signal input.
- 32-bit complex baseband or 16-bit IF output.

- 16- or 32-bit observation signal input.
- Digital correction of Analog Quadrature Modulation distortion for practical zero-IF upconversion.
- Automatic adjustment of corrective parameters in response to changing RMS signal levels.
- State-of-the-art firmware
- Firmware upgradeable to accommodate new features

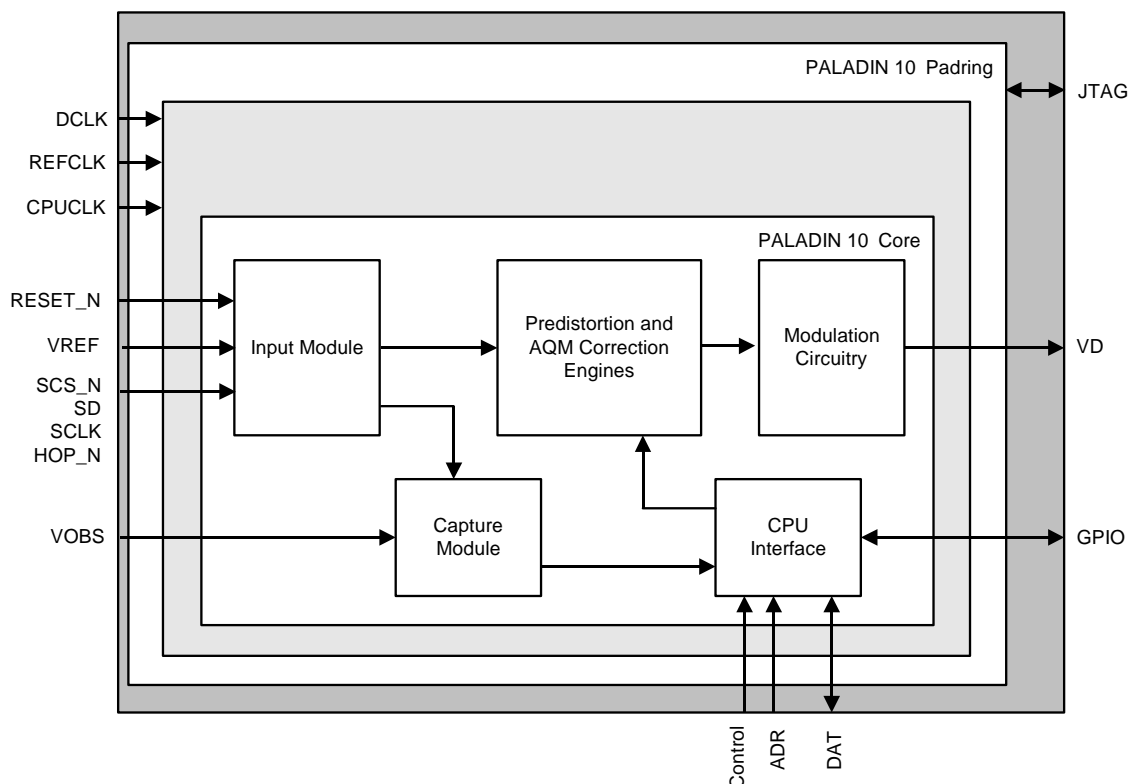
### PACKAGING

- Industrial temperature range (-40 °C to +85 °C).
- 304-pin SBGA with a body size of 31mm x 31mm.

### APPLICATIONS

- Multi-carrier WCDMA, cdmaOne, CDMA2000 1xRTT, and CDMA2000 EV-DO base station transmitters.

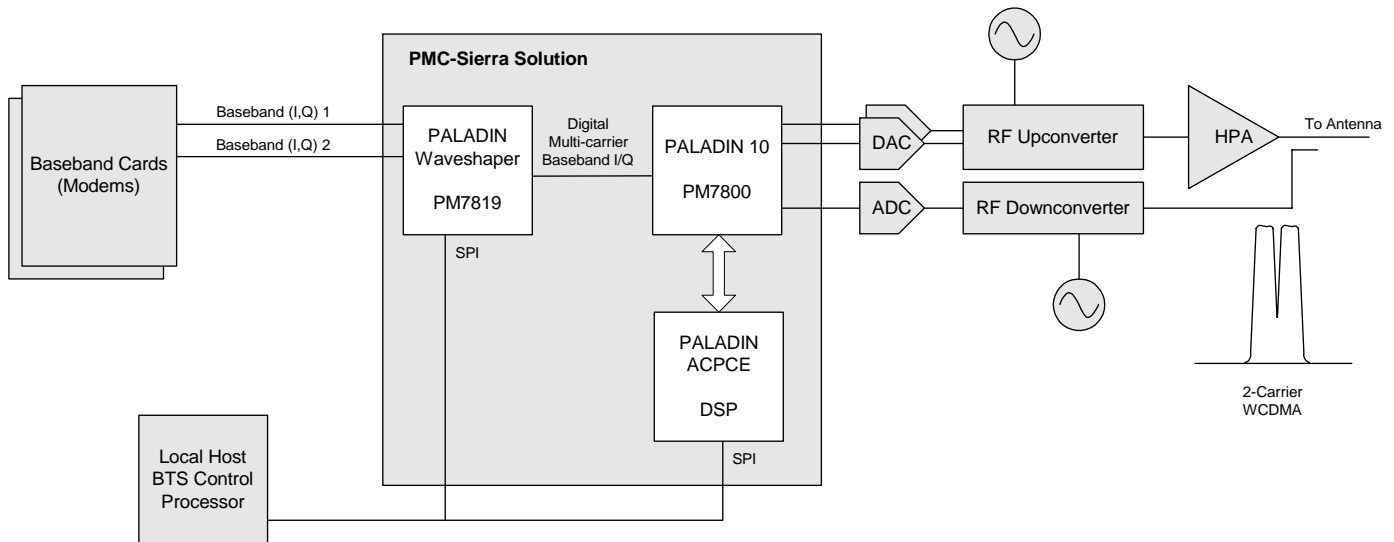
### BLOCK DIAGRAM



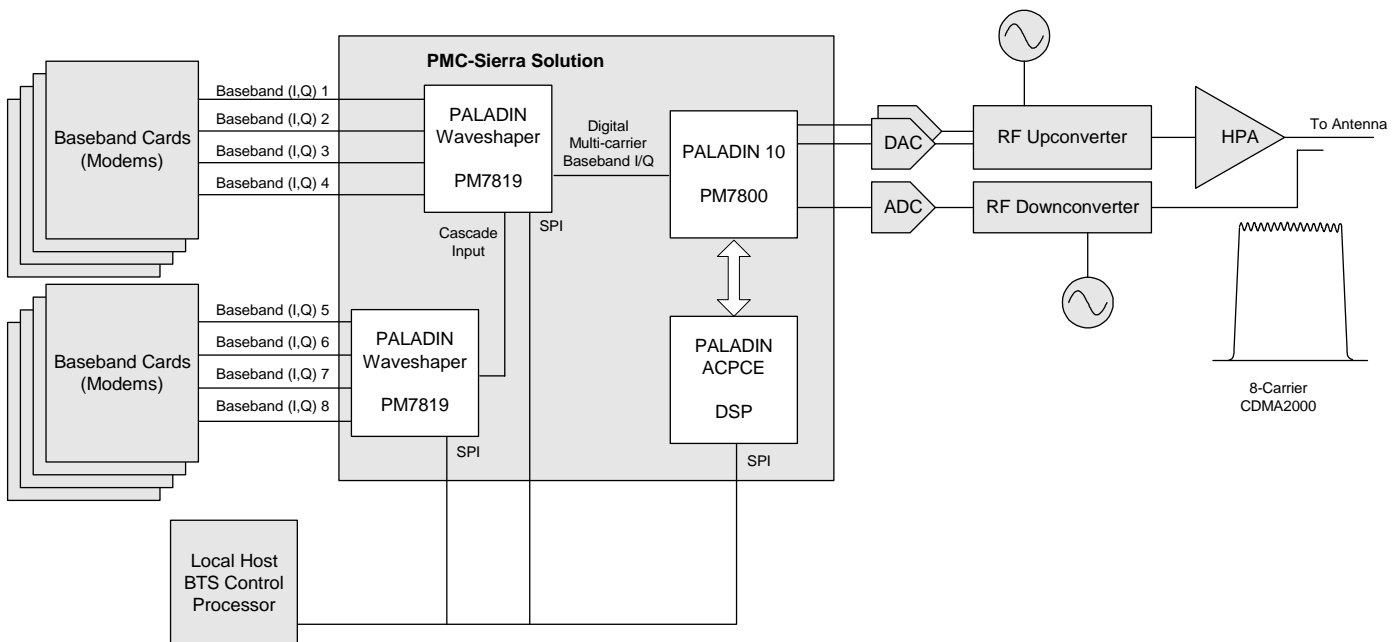
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## TYPICAL APPLICATIONS

### PALADIN 10 MCPA-EQUIPPED WCDMA BTS



### PALADIN 10 MCPA-EQUIPPED CDMA2000 BTS



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